

In re: M. Koike  
Filed: concurrently  
USSN: not assigned  
For: Semiconductor Device, Resin Sealing Method and Resin Sealing Device

IN THE U.S. PATENT AND TRADEMARK

In re Application of:  
M. KOIKE

Serial No.: not assigned

Examiner: not assigned

Filed: Concurrently

Art Unit: not assigned

For: Semiconductor Device, Resin Sealing Method and Resin Sealing Device

**PRELIMINARY AMENDMENT**

Assistant Commissioner of Patents  
Washington, DC 20231

Sir:

Please calculate the filing fee based on the Preliminary Amendment.

Prior to Examination, please amend the above-identified application as follows:

**In the Claims:**

Please amend the claims as follows:

4. (Amended) A semiconductor device as set forth in claim 1 [or 2], wherein said molded resin portion is formed with an over-hang portion overlapping with the upper end surface of said semiconductor device.

5. (Amended) A semiconductor device as set forth in claim 1 [or 2], wherein said molded resin portion is formed over substantially entire area of said wired substrate.

6. (Amended) A semiconductor device as set forth in claim 1 [or 2], wherein said resin is injected through one or more through holes provided in said wired substrate for electrical connection under pressure for forming said under-fill region and said molded resin portion.

9. (Amended) A resin seal process of a semiconductor device as set forth in claim 7 [or 8], wherein a plurality of said through openings and said resin flow passages are provided for performing filling of the resin at a plurality of portions.

14. (Amended) A resin seal process of a semiconductor device as set forth in claim 7 [or 8], wherein filling of said resin is performed through one or more through holes provided in said wired substrate for electrical connection.

15. (Amended) A resin seal process of a semiconductor device as set forth in claim 7 [or 8], which comprises step of setting a plurality of molding objects within the mold and clamping said mold for filling said resin for a plurality of semiconductor chips simultaneously.

18. (Amended) A resin sealing apparatus as set forth in claim 16 [or 17], wherein said mold is consisted of an upper die, an intermediate die and a lower die[.];

said lower die has a cavity portion as a die for outer shape of a molded resin portion of said semiconductor device;

said intermediate die is exchangeably arranged a gate plate formed with a resin injection conduit as a hole formed through a position corresponding to said through opening;

said upper die is formed with a runner as a groove extending to a position corresponding to said resin injection conduit; and

said resin flow passage is formed with said resin injection conduit and said runner.

19. (Amended) A resin sealing apparatus as set forth in claim 16 [or 17], wherein said resin flow passage is formed to a position corresponding to a through hole provided in said wired substrate for electrical connection.

20. (Amended) A resin sealing apparatus as set forth in claim 16 [or 17], wherein said mold is formed with a stepped down portion recessed with a tilted peripheral portion of said cavity portion in a region corresponding to the semiconductor chip.

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**REMARKS**

This Preliminary Amendment amends multiple dependent claims 4, 5, 6, 9, 14, 15, and 18-20 to depend from only one claim. A clean copy of these claims as amended is attached.

If any costs are incurred by filing this Preliminary Amendment, please charge Deposit Account No. 50-2041.

Respectfully submitted,



Michael E. Whitham  
Reg. No. 32,635



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PATENT TRADEMARK OFFICE

CLEAN COPY OF AMENDED CLAIMS

4. A semiconductor device as set forth in claim 1, wherein said molded resin portion is formed with an over-hang portion overlapping with the upper end surface of said semiconductor device.

5. A semiconductor device as set forth in claim 1, wherein said molded resin portion is formed over substantially entire area of said wired substrate.

6. A semiconductor device as set forth in claim 1, wherein said resin is injected through one or more through holes provided in said wired substrate for electrical connection under pressure for forming said under-fill region and said molded resin portion.

9. A resin seal process of a semiconductor device as set forth in claim 7, wherein a plurality of said through openings and said resin flow passages are provided for performing filling of the resin at a plurality of portions.

14. A resin seal process of a semiconductor device as set forth in claim 7, wherein filling of said resin is performed through one or more through holes provided in said wired substrate for electrical connection.

15. A resin seal process of a semiconductor device as set forth in claim 7, which comprises step of setting a plurality of molding objects within the mold and clamping said mold for filing said resin for a plurality of semiconductor chips simultaneously.

18. A resin sealing apparatus as set forth in claim 16, wherein said mold is consisted of an upper die, an intermediate die and a lower die;

said lower die has a cavity portion as a die for outer shape of a molded resin portion of said semiconductor device;

said intermediate die is exchangeably arranged a gate plate formed with a resin injection conduit as a hole formed through a position corresponding to said through opening;

said upper die is formed with a runner as a groove extending to a position corresponding to said resin injection conduit; and

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said resin flow passage is formed with said resin injection conduit and said runner.

19. A resin sealing apparatus as set forth in claim 16, wherein said resin flow passage is formed to a position corresponding to a through hole provided in said wired substrate for electrical connection.

20. A resin sealing apparatus as set forth in claim 16, wherein said mold is formed with a stepped down portion recessed with a tilted peripheral portion of said cavity portion in a region corresponding to the semiconductor chip.